"FLUORINE AND ITS RELATION TO DENTAL HEALTH"

Delivered before the Queensland Branch of, the A.D.A. 22/3/45 by Captain Eliot F. Beach, Sn.C, (Note.-Capt. Beach is a Bio-Chemist)

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I. INTRODUCTION:

Fluorine is the lowest weighted chemical element of the halogen family and is closely related in properties to chlorine and iodine. It occurs widespread in nature, being 13th in the order of predominance of elements in the earth's crust. In combination with calcium and phosphorus or aluminum, it makes up many common minerals and ores. Despite the important position of fluorine in the mineral kingdom, it assumes the very minor role of a trace element in living matter. There is evidence that fluorine has no physiological function which is indispensible to

Annotated Comments 2014

This document contains the full OCR text from the article published in the **"**The Australian Dental Mirror. [Vol. 11, no. 4]**"** in 1945, listed as the official organ of the Australian Dental Association, Queensland Branch. It can be found online at the URL at the end of the article on the left.

I have formatted the text for ease of reading and deleted only the occasional optical artefact which has been interpreted by the software used as grammatical characters. Typographical errors and American spelling or outright spelling mistakes have been left as printed for authenticity. The original page numbers have been left as per the original printed copy.

The fact that the author was an Officer of the U.S Army has been omitted from the OCR text for some reason! This is relevant as he uses a reference from Harold Hodge (reference 20) who was the Toxicologist on the "Manhattan Project" which used Uranium Fluoride in the ore refining process. Hodge's calculations, which were accepted and used for many years as the basis for levels for safety, have been proven incorrect by a large factor.

The first part of the article deals with the science of elemental fluorine as was known about at that time and seems to be factual. Certain phrases have been highlighted (indexed superscript numbers) to draw the reader's attention to comment relevant to the

the animal body[1] and that its occurrence there is rather fortuitous, reflecting merely the intake of the element in food and water. When fluorine enters the body it exhibits several peculiar physiological properties and has become of interest to the bio-chemist for two reasons: first because of its toxicity in chronic fluorotoxicosis [2] and, second, because of its recent implication in reducing the incidence and severity of dental caries[3].

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II. FLUORINE INTOXICATION.

Fluorine exhibits severe toxicity, and before a consideration of the physiological properties of fluorine, it is pertinent to mention the poisonous qualities of fluorine compounds. Consumption of the element in sufficient quantity or the inhalation of gases and dusts containing certain fluorine compounds results in a condition known as fluorotoxicosis[4]. Symptoms vary, depending on the chronicity of the disease, which has been excellently described by Bosworth (1), Pierce (2), and many others. The disease is found widespread particularly among cattle and severely only occasionally in men. In volcanic areas after eruption, serious agricultural hazards exist, due to contamination of the grass with fluorine rich volcanic dusts. During an eruption in Iceland, in the early 18 hundreds, large numbers of sheep were lost with acute fluorotoxicosis. It is of interest that in recent years museum specimens of bones from sheep killed in the Iceland incident have been analyzed and found to contain greatly increased quantities of fluorine. Chronic fluorine poisoning is found in some areas rich in phosphate minerals. This may usually be traced to consumption of heavily fluorosed drinking water which, in passing through fluorine-containing soil layers, has become charged with the element. Thus in Algeria, Tunisia, Morocco, cattle are often affected. This condition has been known in exist in Italy, China, Japan, India and United States and is quite widespread. Calcium phosphate rock is a frequent adjuvant to cattle feeds, but it is selected carefully from varieties containing minimal qualities of fluorine[5]. Industries utilizing minerals containing fluorine are not uncommonly hazardous to both man[6] and animals. Effluents from such factories have been known to spread from chimneys over fairly broad areas. Thus in Eastern Germany, Denmark, Norway and France, at various times, fluorotoxicosis has been traced to such industries. [7] The most frequent offenders are installations treating superphosphates, aluminum smelters using cryolite and bauxite, copper smelters, glass, enamel and brick works using sands and clays of high fluorine content[8]. Acute symptoms of fluorotoxicos in man are diarrhoea, nausea, convulsions and terminal vaso-motor

issue of water fluoridation.

[1]Here for example is the admission that fluorine is not essential and yet the pro fluoridation lobby have consistently claimed it as a necessary micronutrient. [2] Beach goes on to claim its toxic nature and then by association [3] claims an implied benefit.

[4] In the second part of the article while acknowledging the undoubted toxicity of fluorides he does not mention Kaj Roholm who authored the definitive text on fluorine toxicology published nearly ten years before this article.

[5] Mineral rock for stock feed is deliberately chosen to avoid contamination with fluorine.

[6] Beach admits the connection with emissions from industrial plants and that these are known to be poisonous to human health.

[7] It is known that the condition of fluorine induced ill health is caused by emissions from industries associated with this element.

[8] He then goes on to name the industries producing such toxic waste and it is known these are the same sources of the chemicals used in water fluoridation.

[9] Even the fact that fluorine is involved in disturbances to normal metabolism and its ultimate

collapse. Chronic fluorotoxicosis in animals results in osteosclerosis, enlargement of the joints, emaciation, reduction in milk flow due to distortion of calcium and phosphorus metabolism, lameness, stigmata on the teeth which will be discussed in detail later, and eventual brittleness of the skeletal structure[9] to such an extent that spontaneous fracture occurs. Recent conversations with local Australian scientists have indicated that Queensland and other sections are not free of

the fluorine hazard. In some sections, cattle and sheep watered from deep artesian bores have shown fluorosis symptoms. This may become a serious factor in many areas, yet undeveloped in Australia. Also, in some station areas where soil is rich in phosphates, endemic fluorosis of the teeth or tooth mottling occurs among the human population[10]. Work with experimental animals by McCollum and co-workers (3) at John Hopkin's University, Baltimore, was among the first to show many interesting features of fluoride intoxication in the albino rat. One of the most unique effects in rats fed in sub-lethal doses of sodium fluoride was in the development of the incisor teeth. In the rat, the incisors grow continuously throughout life, and are normally worn down by attrition. Chronic fluorine poisoning makes the incisors somewhat more brittle[11], but of such a hardness that normal attrition fails to wear them down, and such animals develop fantastic tusk-like incisors which grow to unusual lengths unless fractured during growth[12].

III. THE PHYSIOLOGICAL PROPERTIES OF FLUORINE. **Its storage and Utilization.**

Before entering into a discussion of the effect of fluorine on teeth, specifically, there are some very salient features of fluorine metabolism in the body which should be mentioned as a background. Recent developments have revealed, many interesting features in the biochemistry of this element. Far and away the greatest storage point for fluorine in the body is the hard skeletal structure[13]. Bone contains as much as 350 parts per million of fluorine, depending, of course, on the quantity of fluorine consumed by the animal. 2,000 parts per million of calcium fluoride are not uncommon. It is found as a constituent of the dentine and enamel of the teeth. Calcium phosphate structures in the body like mineral calcium phosphate, have the peculiar property of drawing fluorine into their structure[14]. Thus powdered bone, powdered enamel, dentine or the mineral apatite will absorb fluorine into their structure even from water solutions of fluorine compounds at great dilution. Soluble fluorine compounds are readily absorbed by the body, but only slowly excreted. Fluorine is more or less cumulative within the body[15]. Fluorine

manifestations is described.

[10] Endemic fluorosis was known to exist in Australia even in 1945.

[11] Where water flows through fluorine containing rock such as cryolite where weathering has produced soil high in phosphates drinking from this contaminated source produces dental fluorosis resulting in brittle teeth.

[12] The abnormal growth of the tooth, which may resist abrasion but is weaker in its elastic modulus.

[13] Here he is describing the accumulation of fluorine in bone, which as we know contains marrow and the blood forming organs are housed here.

[14] Calcium and phosphate are shown to attract fluorine from solution and readily bound in mineral structures with little release over time.

[15] Bioaccumulation effects known of then and yet denied ever since.

[16] Fluorine is known to inhibit certain enzymes involved in fat and carbohydrate metabolism, which are a vital source of energy for all life forms, including humans.

[17] Its supposed action in tooth decay prevention is based on a *belief*, not a proven scientific fact.

[18] Again the knowledge of its enzyme inhibiting

is a strong and specific enzyme poison. It inhibits the splitting of fats by the esterase lipase (4). Likewise, it has been shown to poison some enzymes involved in the fermentation of carbohydartes to form acids[16]. This is suggestive of a possible means by which fluorine may control dental caries inasmuch as organic acids from carbohydrate fermentation are believed by many to initiate the caries process[17] on the tooth enamel surface. Fluorine inhibits the

enzymatic release of phosphate ions from certain organic phosphates (5) and this suggests a basis for its involvement in the metabolism of calcium and phosphorous which is known to depend upon the smooth functioning of phosphatase enzymes[18]. Finn (6) has shown that rats placed on a rickets producing diet are protected to some extent by the administration of sublethal doses of fluorine: Thus the eventual mortality from a rachitogenic diet is considerably deferred. Bone density in rickets is maintained better when fluorine is given (7), and even partial though atypical healing may result. Recovery from "fluorine rickets" is always peculiar and the disorderly repairs suggests that fluorine deranged the orderly normal structure of the organic matrix[19]. The thyroid gland has been found unique among the soft tissues in its ability to store fluorine. Experiments have shown that fluorotoxicosis and hyperthyroidism mutually exaggerate each other[20] (8 and 9). Thus, the daily administration of desiccated thyroid in small amounts that normally have little effect on the basal rate will result in a great increase in the basal rate if a small quantity of fluorine accompanies it. In spite of the seeming physiological role of fluorine, there is no evidence that fluorine is essential to the body in the regulation of any physiological function. Animals have been reared successfully from one generation to another on dietaries so extremely low in fluorine that any physiological role of fluorine is doubtful[21] (10). In the ensuing discussion on fluorine as it effects the tooth structure, it is well to bear in mind the importance of such processes in which fluorine is functional, such as:

1. Retardation acid production in fermentation of carbohydrates.
2. Calcium and Phosphorus economy in rickets.
3. Inhibition of enzymatic release of phosphates from organic compounds.
4. Interrelationship with the thyroid gland and implications this may have in the mineral economy. [22]

qualities.

[19] Here is recognition that repaired tissue is *abnormal* with the presence of fluorine.

[20] The thyroid gland, part of the endocrine system, which regulates metabolism, is susceptible to unwarranted influence from fluorine. It should be borne in mind that the main constituent of thyroid hormones is iodine, another member of the halogen family of elements. Fluoride was used to inhibit hyperactive thyroid glands.

Through the halogen exchange principle fluorine can displace any of the other halogens in molecular structures thus affecting their role in metabolic processes. Standard thyroid tests will not necessarily determine if this is occurring.

[21] Once again the admission that fluorine is **NOT** a nutrient!

[22] At left, points 1-4. Does this sound like something one wants indiscriminately circulating in one’s body.

[23] Recognition that mottled teeth, dental fluorosis, is an unwelcome condition caused by an impurity in water not a beneficial mineral as pro-fluoridationists claim.

[24] Hardly the so-called “cosmetic effect” that dentists and doctors claim.

[25] We see here the introduction of the term

IV. FLUORINE IN RELATION TO DENTAL PROBLEMS.

a. Mottled Enamel.

The peculiar condition of mottled enamel was first described in dental literature by Black (11) in 1916. This American worker made his classic studies on teeth from individuals in a section of the Rocky Mountains, and described the disorder with great exactness. He found that the condition existed in circumscribed areas and was endemic in character. After elimination of other possible causes, it seemed

likely that some component of the local water supply must be at fault. Under endemic dental fluorosis the principal fault in tooth enamel is the failure of the interprismatic cementing substance as well as defective structure within the enamel rods themselves[23]. As a consequence, there are found on the tooth surface areas which at first have an unglazed paper white appearance. Between such plaques is apparently normal enamel of the usual shiny whiteness. After a time the white unglazed areas take on a coloured stain which progressively becomes more disfiguring passing from creamy yellow through brown to eventual black. This damage once present in the tooth remains throughout life, for there is no cure and no amount of polishing does any good for the fault is within the tooth structure[24]. Even moderate fluorisos is a difficult cosmetic problem which can be relieved only by jacket crowiing or the removal of the front teeth and replacement with a prosthetic device[25]. The stain in fluorosed teeth exists within the enamel substance[26a]. Plaques of this sort extend one-third to one-half of the way into the enamel[26b] toward the enamel dentine junction. They are more numerous on the crown end of the tooth, incisors and cuspids are more severely affected and the labial surface of the tooth is more heavily involved than the lingual. Injury of this type[26c] occurs in the pre-eruptive stage of tooth development when enamel formation takes place[26d]. Thus examination of persons who have moved into endemic fluorosis areas at different stages of development reveals that:-

(1) Those present during the first five years of life show fluorosis in all teeth, including incisors.
(2) Those not in the area till after the 5th year show the stigma only in the bicuspids and-

cosmetic, which the fluoridation propaganda has reiterated so effectively ever since. The term cosmetic refers to the visual appearance of some thing, it is not a medical term relating to the actual condition of that thing. A cosmetic product is something which covers, or goes on the surface.

[26 a,b,c,d] Dental fluorosis is a condition of the teeth. It is not “merely cosmetic” as often stated but actual damage to the tissue due to a metabolically adverse event. Dental fluorosis is an indication of exposure to toxic levels of fluoride in the body when the tooth is developing but are not the only tissue affected.

[27] Hard water is so termed because of the level of minerals present, particularly calcium and magnesium, which *are* essential nutrients. In natural water supplies fluorine may also be present but always in combination with a metallic mineral, forming a fluoride salt. These forms of fluoride are generally insoluble so may pass through the gut without being absorbed into the blood stream.

[28] This level of concentration has been substituted for the term *dose*, which it is *not*. A dose of anything is how much an individual consumes in a given period. At the recommended rate of consumption of drinking water of eight glasses per day this would be about two litres, containing about 2 mg of fluoride.

[29] Even so, these forms of fluoride cause fluorosis in 10% of the population at the concentration of one part per million. That is, one

molars.
(3) Those present in the area only after about the 11th show involvement only of the third molars.
This corresponds roughly to the periods during which enamel forms in the various teeth.

At first attempts were made to associate mottled enamel with water hardness. Success in such correlations only obtained because fluorine is usually present in hard waters[27]. It was evident, however, that many hard waters will not produce mottling. Smith, Lantz and Smith (12), in 1931, were among the first to prove fluorine as the causative agent. This work was done in Arizona in the St. David area. Other workers made the same conclusion simultaneously. Mottling has been observed throughout the world always in circumscribed areas and wherever the fluorine content of the water supply rises above a critical level. It has been observed in Japan, China, the Punjab in India, England and in the Argentine, as well as in many areas in the United States.

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The critical concentration of fluorine[28] in the communal water supply which will produce fluorosis appears to be about one part per million. At this point 10 per cent. of the population show microscopic evidence of fluorosis[29] but are in no sense disfigured. Below this concentration mottling is never seen. Above one part per million mottling becomes progressively more intense. Over 2.5 parts per million of fluorine is sufficient to produce a marked degree of mottling. Ainsworth (13) has described mottling in England in a town in which the water supply ranged from 4.5 to 5.5 parts per million. Excellent studies on the fluorine content of waters and mottled enamel have been carried out by Dean and his co-workers under the U.S. Public Health Service (14). When endemic dental fluorosis is moderately severe the character of the teeth is somewhat altered. Teeth are slower to erupt and tend to be shorter and more block shaped and low crowned. They are more fragile and brittle than normal teeth and this fragility may interfere with correct filling, with fillings poorly retained in the defective, abnormal tooth structure. Fluorosed teeth tend to form numerous and deep pits and fissures[30].

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Interest in fluorine was at first centered about the cosmetic problem it produces in mottled

fluoride ion to one million water molecules. There is about 1 milligram of fluoride in 1 litre of water at this concentration.

[30] Here Beach indicated to dentists a greater source of income from water fluoridation as it will increase the amount of work required by their growing number of clients.

[31] He claims a benefit in reducing tooth decay without quoting a source for this. In these statements we see the beginnings of the water fluoridation propaganda war. He softens up the audience, the dentists, with reputable scientific facts and then introduces the conversion of fluoride from harmful toxin to beneficial additive.

[32] The town of Buaxite, named after the aluminium ore mined there, is relevant as, has been previously stated, fluorine pollution is associated with aluminium production. Corporate profits versus community welfare?

[33] The claims of an association do not confer a direct, cause and effect relationship, nor do they recognise the high levels of other minerals contributing to the formation of teeth, nor the general diet of the inhabitants in communities surveyed.

These so-called studies have consistently been criticised for their poor procedural quality and cannot be claimed as scientific.

Endorsements of the process of the mechanical

enamel. Recent observation that fluorine exerts an unmistakable effect in reducing and retarding dental caries has made this subject one of the most promising and fruitful subjects in dental research. [31]

(b) Problem of Caries Resistance.

1. Epidemiological surveys of wide scope have been completed in the United States which demonstrate communal water supply is a factor in controlling dental decay. Dean and associates (16) are responsible for the most comprehensive work along these lines. At present their surveys cover over 20 cities throughout the United States. The original studies centered around Bauxite Arkansas and now include various suburbs of Chicago, cities throughout Illinois and in the other States where combinations of circumstances permit this type of observation[32]. Smaller scale studies in Wisconsin (16) and by Taylor (17) in Texas in the now famous Deaf Smith County area are of great interest.

Briefly, these have revealed that there is an inverse relationship between incidence of dental caries and the fluorine content of the communal water supply[33]. Where the water supply contains more than 1 part per million the caries incidence is one-third to one-half as great as it is in communities in which the water contains less than 0.5 parts per million. Furthermore, they have found that the fluorine exerts a greater protective influence upon teeth in certain areas in the mouth. Using the age group of 12 to 14 years, it has been shown that in the four upper incisors there is about one-twentieth the caries experienced in cities using water containing over 0.6 parts per million of fluorine than there is in cities using waters of less than 0.5 parts per million fluorine concentration. In these same groups, there is one-quarter the caries experience in the molar teeth showing a much lower though higher significant degree of protection.

Chemical studies in the field of fluorine have been stimulating. Armstrong and Brekhus (18) discovered that the fluorine content of enamel from non-carious teeth is greater than that in carious teeth, while the fluorine content of dentine is the same in both types of teeth. Thus enamel from the sound section of carious teeth in their studies showed 0.007 per cent. fluorine, whereas enamel from sound teeth showed 0.01 per cent. fluorine. This same conclusion is substantiated by a South African worker, Ockerse (19).

Animal experimentation has been used also in a study of the effect of fluorine in preventing

addition of fluorides to public water supplies, with the aim of reducing the incidence of dental caries, rely mainly on the results published from five trials which were set up to test, primarily, the efficacy of this process.

Important deficiencies in the methods used were revealed during a preliminary investigation of reports of these trials. Therefore this study was undertaken in an attempt to answer the question: Can the claims of considerable dental benefits as a result of artificial fluoridation be regarded as established, or are they based on an unsound foundation.

P.R.N.S.

From the preface to the monograph “Fluoridation - Errors and Omissions in Experimental Trials” Melbourne University Press, 1959,Parkville N2, Victoria, Australia, by Pof. Sutton D.D.Sc. (Melb.) L.D.S (VIC.) Senior Research fellow, Department of Oral Medicine and Surgery Dental School, University of Melbourne.

[34] Evidence that diet causes caries not lack of fluoride.

[35] Admission that the mechanism of a claimed benefit is unknown.

[36] He goes on to claim that it has been proven that fluoride in water protects teeth in the mouth, as if all the dangers previously mentioned are

dental caries. While there is a great difference between the tooth structure in man and the albino rat, certain conclusions in rat experiments are valid in supporting the fluorine thesis. The rat incisor is a con

tinuously growing structure, throughout adulthood. Caries in the incisor can be induced by the feeding of a special caries producing ration[34] in which coarsely ground corn meal is the principal constituent. The hard granules in the food induces caries apparently through their abrasive action on the tooth surface. Finn (20), among others, has shown that fluorine exerts a marked protective action against experimental rat caries.

2. The mechanism by which fluorine protects the teeth against decay is only poorly and partially known. [35] While the mottling effect of fluorine is quite evidently produced prior to teeth eruption, there is evidence that protective action of fluorine containing water supplies is most importantly exerted upon the erupted teeth[36] itself. Thus Dean has shown in the Bauxite Arkansas studies during which the communal water supply was shifted from a high to a low fluorine source, that consumption of fluorine bearing waters during the first 8 years of life only confers but half the caries immunity that continuous consumption of such waters though adulthood would do[37]. In accounts of caries resistance in Deaf Smith County, Texas, there are reports that conditions there produce an arrest of the carious process in adults who move into the area.

It is also pertinent that protection of the upper incisors by fluorine bearing waters is at least four times as great as the protection conferred on molars. These are the teeth which, during drinking, are most effectively exposed to water. Such facts are most suggestive that fluorine is effective upon the adult tooth enamel itself.

Saliva is known to be important as a factor in caries prevention. Proper washing of the tooth surface with saliva is quite significant and it might be thought that fluorine could act through this mechanism. [38] In testing this theory, Cheyne (21) has removed the salivary glands of rats and in these animals found that oral administration of fluorine is still very effective in reducing incidence of caries. Studies with radioactive fluorine show that even large increases in blood fluorine result in no increase in salivary fluorine content. Studies of saliva from children

irrelevant.

[37] How does he come to the conclusion that continuous consumption would protect teeth for life if the survey had not run long enough? What does caries immunity mean? Caries are damaged areas of teeth as a result of inadequate repair function, not a disease-causing organism in themselves!

[38] For fluorine to be present in any quantity in the saliva it must of course be present in the blood, which means entering via the gut. As naturally occurring fluorides are largely insoluble, to get enough fluorine into saliva would necessitate consuming massive amounts of water or water containing massive amounts of fluoride. The studies quoted demonstrate, if they can be relied upon, that any notion of fluorine being a necessary micronutrient to be absurd. If it were effective to incorporate fluorine in the tooth enamel to benefit the tooth the salivary gland would be efficient at doing so but it appears to work to prevent this.

[39] To suggest that ingesting a known enzyme poison to impair a bacteria merely implicated in caries incidence, whether it is indeed a cause or not, without expecting similar harm to the human host is scientifically and medically implausible.

[40] Lactobacillus Acidophilus is considered one of eight micro-organisms essential for normal healthy gut function. If they can be impaired in the mouth by a substance which is destined for the gut

consuming high and low fluorine waters indicate that salivary fluorine content is the same in both. Fluorine waters protect the upper incisors which are least effectively washed with saliva to a greater degree than they do the lower incisors which are well supplied at all times with saliva. Thus while saliva in its own right is caries protective, it is doubtful that the protective action of fluorine is exerted through this medium.

Mentioned previously in the discussion was the ability of fluorine to poison certain enzyme systems of importance in the formation of acids in the fermentative degradation of carbohy

drate. That is a possible means by which fluorine might exert its enamel sparing action. [39] In this regard it should be recalled that extensive studies in areas where fluorine-bearing waters are consumed demonstrate that the lactobacillus acidophilus counts in saliva are much lower than is normally found in fluorine low areas (15). This organism is strongly implicated in dental decay and the lowering of the L. Acidophilus counts wherever fluorine exerts its protective power can hardly be expected as fortuitous[40].

As concerns the effect of fluorine on enamel solubility it has been demonstrated that tooth enamel, dentine, bone, calcium, phosphate rock when powdered will absorb fluorine from very dilute fluorine solutions. Furthermore, samples treated in this way or powdered enamel from mottled teeth show a considerably lowered solubility in organic acids such as lactic and pyruvic than do untreated or fluorine free samples (21). That fluorine can reduce solubility of such calcium phosphate compounds suggests a role of fluorine in this regard. [41]

Volker (22) and others have shown by the use of radioactive fluorine that this element may enter the tooth dentine through the systemic circulation, but that enamel takes up fluorine through direct absorption of this element on its surface. The evidence is overwhelmingly in favour of the belief that fluorine exerts its protective action[42] on the tooth through its direct absorption into the enamel surface from fluorine containing waters irrespective of ingestion of the fluorine or its absorption into the systemic circulation.

3. Fluorine as a prophylactic against Dental Caries.

what disorders might be expected then?

[41] The fact that these minerals absorb fluorine from dilute solutions merely illustrates their vulnerability to the toxic effects of this element. The solubility of tooth enamel has consistently been used to *demonstrate* an alleged protective effect, however re-mineralisation of the tooth enamel via nutrients in the tooth tissue gel and the saliva are sufficient in a normally healthy person eating a diet low in processed carbohydrates and low in refined sugars, which are claimed to nourish the alleged offending bacteria.

[42] Once again we see the use of the term belief, as if an ideological bias can have medicinal properties! He then suggests that a mouth rinse may be effective but that drinking it wouldn't be. Confusing and contradictory to say the least. A common theme in fluoride propaganda.

[43] Beach tells the dentists that they should use the claim that science supports the hypothesis that an entire population can be made immune to dental decay by adding fluorine to the communal water supply. In science legitimate theories may be developed from careful consideration of the facts. To formulate a theory and then go looking for evidence to support it is an ideological pursuit, akin to formulating a world view from one's belief system or a delusion stemming from a mind control cult.

[44] He even warns that people will object to experimentation with a toxic chemical and hints

Evidence presented herein demonstrates that fluorine acts to prevent dental caries and yields a natural resistance to tooth decay in large population groups. The problem confronting dental science at present is that of utilising the available knowledge and to confer this immunity to dental decay to all populations. Work along these lines is progressing rapidly in many places (24) and it is only a question of a year or two until the theories involved may be tested[43] and the most effective means of fluorine application devised for reduction of caries experience.

There is, of course, the possibility of adding fluorine to communal water supplies in an amount sufficient to confer some protection, but insufficient to produce undesirable results. But there are many objections, to the addition of a toxic element to water being consumed by whole populations. Protection would be variable and dangers involved in the experiment would place an almost prohibitive responsibility upon public agencies responsible[44] for such a move.

Inasmuch as fluorine exerts its action at least in part, through local absorption into the adult enamel, it would seem that the ideal means of prophylaris with fluorine would be the

local application of fluorine solutions to the tooth surface. Such experiments are now in progress in an attempt to determine the most effective concentration and means of application of fluorine. The very few reported to date have yielded variable but rather hopeful results.

Bibby (25), at Tufts Dental School, Boston, has reported an interesting but brief series of observations on 100 children in the Bronoton, Massachusetts Public Schools. For 2 years, 3 applications of fluorine 1:1000 solution were made to 1 quadrant of the mouth. The other quadrant served as control. At the end of 2 years, 80 subjects remained of the original 100 subjects. In these 80 patients, 83 new cavities developed in 2 years, in the treated quadrant, while 124 new cavities developed in the untreated quadrant. The reduction of caries amounted to 40 per cent. in the molars, 33 per cent. in the bicuspids, and 34 per cent. in the anterior teeth.

Cheyne (26) also has reported a limited -series from Indianapolis on application of a 500 parts per million solution of fluorine in 5 and 6 year old children. 27 children were treated, and 19 selected as controls. In this experiment, about 3 in carious surfaces developed in the untreated children and about 3 in the treated subjects. This is also suggestive evidence but far from

that governments do not have the necessary authority or protection from liability for water fluoridation.

If the comments in the latter part of this article are what have been used to justify water fluoridation then I fail to see how one can draw such conclusions of “proven safe and effective for all” from information such as this.

The statistics from the Bibby and Cheyne studies reported here, even if accurate, well conducted and bias free, which I’m sure they weren’t, do not provide convincing evidence to justify water fluoridation. They of too short a time span to demonstrate any long term benefit or, more importantly, to eliminate any harm from chronic ingestion of a systemic poison such as has been described here.

I would encourage anyone reading the report of this presentation to the Queensland Branch of the Australian Dental Association to scrutinise it for factual content and the presence of certain *Public Relations* style phrases, which have entered the arena since this time. Even though it is a presentation and not a scientific study presented for peer review by a journal representing a professional field of study, none the less, people have used this kind of report as evidence for the justification for water fluoridation for many decades now.

I hope those reading my critique of this report will recognise, as I have, that this type of propaganda

complete. Dean and Associates have had no success in reducing caries experience in Army personnel with a single application of a 5000 parts per million solution of fluorine. Future developments in the use of fluorine as a prophylactic against dental decay will be awaited with great interest in all sections of the dental profession.

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was being introduced at a time leading up to the introduction of the first water fluoridation plant in Australia. This was at Beaconsfield in the Tamar estuary in Northern Tasmania. This town is just across from the aluminium smelter at Bell Bay and was fluoridated prior to the commissioning of the smelter. You will recall from Beach's report that aluminium smelting is a source of atmospheric fluoride pollution! The Tamar Valley suffers from persistent winter inversion layer weather phenomenon whereby air, containing effluent from smelters, is trapped and this is known to exacerbate air pollution problems. Launceston, at the head of the valley, has historical air quality problems and was once rated in the top-ten worst cities in the world for air quality, along with places like Mexico.

Read "The Fluoride Deception" by Christopher Bryson and "The Greatest Fraud – Fluoridation" by Philip Sutton for more background on this subject.

My report to the Tasmanian Government Minister for Health, "Killer Smile" is available upon request via email at tasdntl@gmail.com.

Bernard Needham

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